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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,414	02/27/2002	Joseph A. Kwak	1-2-0203.1US	8154

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EXAMINER	
TSEGAYE, SABA	
ART UNIT	**PAPER NUMBER**
2662	

DATE MAILED: 03/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/084,414	KWAK, JOSEPH A.	
	Examiner	Art Unit	
	Saba Tsegaye	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/06/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed 02/17/06. Claims 1-12 are pending. Currently no claims are in condition for allowance.

Claim Rejections - 35 USC § 103

2. Claims 7, 8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schramm et al. (US 6,208,663) in view of Fong et al. (US 6,931,569), Yong, III et al. (US 6,522,650) and Cheng et al. (US 2002/0191544).

Regarding claim 7, Schramm discloses, in Figs. 3 and 5, a physical automatic request repeat apparatus employed by a subscriber unit, comprising: a transmitter having (RBS 22): means for receiving data (a radio base stations 22); means for formatting the received data into packets for transmission to the receiver, each packet having a particular encoding/data modulation (a radio base stations 22; column 5, lines 46-58); means for transmitting the packets (column 5, lines 25-45); means for retransmitting a packet, if an acknowledgment for that packet is not received (column 7, lines 39-53); means for collecting retransmission statistics (column 7, lines 1-13); and means for adjusting each particular data modulation using the collected retransmission statistics (column 7, lines 1-38); and a receiver having (MS 12); means for receiving packets (MS 12)); means for decoding and error checking each received packet (column 5, lines 46-column 6, line 11). Further, Schramm discloses that the ARQ protocol is the RLC layer. An LLC frame to be transmitted by RBS is segmented into RLC blocks then transmitting the blocks to the mobile station through the physical layer (data is received from a higher layer ARQ mechanism).

Schramm does not disclose generating an acknowledgment at the physical layer and the physical layer ARQ mechanism uses packets, which are smaller in size than the higher layer ARQ mechanism.

A physical layer ARQ mechanism is well known in the art. Fong teaches **a dual protocol layer automatic retransmission request scheme** for wireless air interface (see fig. 2 and column 5, lines 26-52). Fig. 4 illustrates that each packet received by a physical layer form a link layer is packaged into **multiple physical layer frames in order to support a lower data rate** (column 6, lines 15-30). Further, Fong teaches that layer 1 ARQ operations provide a quick recovery for physical layer frames that are lost or received erroneously though retransmission of the physical layer frames.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schramm's ARQ method to incorporate the teachings from Fong of a dual type arrangement and formatting the received data blocks into smaller size, the motivation being that by including two levels of ARQ operations, layer 1 ARQ operations provide a quick recovery for physical layer frames that are lose or received erroneously through retransmission of the physical layer frames and the ARQ system will be more reliable by eliminating any significant additional overhead and provides robust operations across the wireless link (column 2, lines 39-60).

Further, Schramm does disclose a transmission system that retransmits a packet if a request for retransmission is received. However, Schramm does not expressly disclose monitoring a return channel for receipt of an acknowledgment for each packet that the packet has

been received, limiting the number or retransmissions to an operator-defined integer value, and clearing the buffer memory after the integer value is reached.

Yonge illustrates, in Figs. 23 and 24, flow diagrams of a response resolve process performed by the frame transmit process of TX handler. Further, Yonge teaches that process 444 determines if the NACK-count is greater than the NACK-count threshold (in this example, a threshold of 4). If the NACK-count is determined to be greater than the threshold of 4, then the frame is discarded (column 26, line 60-column 27, line 41, esp. column 27, lines 13-22).

It would have been obvious to one ordinary skill in the art at the time of the invention was made to add a retransmission counter that limits the number of retransmissions to an operator defined integer value and clears the buffer memory after the integer value is reached, such as that suggested by Yonge, in the retransmission system of Schramm in order to avoid unnecessary usage of the communication resources in case of a poor communication between a source and a destination and furthermore, to avoid overflow.

Further, Schramm does not disclose a physical layer ARQ mechanism is transparent to the higher layer ARQ mechanism.

Cheng teaches that a dual layer ARQ scheme where a physical layer ARQ mechanism is transparent to the higher layer ARQ mechanism (paragraphs 0042-0043).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schramm's ARQ method to incorporate the teachings from Cheng of a physical layer ARQ mechanism is transparent to the higher layer ARQ mechanism, since Cheng suggests in paragraph 0043 that the physical layer ARQ mechanism being transparent to the higher layer ARQ mechanism would reduce implementation complexity and eliminates delay.

Regarding claim 8, Schramm discloses the base station wherein the particular encoding/data modulation is forward error correction FEC encoding /data modulation (column 7, line 54-column 8, line 11).

Regarding claim 11, Schramm discloses the base station wherein the acknowledgments are transmitted on the fast feedback channel using a CDMA air interface (column 4, lines 49-56).

Regarding claim 12, Schramm discloses the base station apparatus whereby said means for generating generates a negative acknowledgment, if that packet has an unacceptable error rate (column 7, lines 39-45).

3. Claims 1, 2, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sipola (US 6,529,561) in view of Yong, III et al. (US 6,522,650), Schramm (US 6,208,663), Fong et al. (US 6,931,569) and Cheng et al. (US 2002/0191544).

Regarding claim 1, Sipola discloses, in Figs. 2 and 5, a base station implementing physical layer automatic request, including a transmitter (260) and a receiver (264), the base station comprising:

a physical layer transmitter for receiving data (270), formatting the received data into packets, each packet having a particular encoding/data modulation, transmitting the packets (202, 204) (column 10, lines 7-15; steps 500, 502), and retransmitting packets in response to failure to receive a corresponding acknowledgment (234) for a given packet (column 10, lines 16-28);

an ACK receiver for receiving the corresponding acknowledgment (step 5104 column 7, line 60-column 8, line 3); and

a physical layer receiver for demodulating (2 10) the packets (column 10, lines 29-40);

a combiner/decoder (222, 218) for buffering, decoding and detecting packet errors (step 516; column 10, lines 54-60); and

an acknowledgment generator (224) for generating an acknowledgment for each packet, if that packet has an acceptable error rate (step 510; column 7., line 6o-column 8, line 3).

Sipola does not expressly disclose monitoring a return channel for receipt of an acknowledgment for each packet that the packet has been received, limiting the number or retransmissions to an operator-defined integer value, and clearing the buffer memory after the integer value is reached.

Yonge illustrates, in Figs. 23 and 24, flow diagrams of a response resolve process performed by the frame transmit process of TX handler. Further, Yonge teaches that process 444 determines if the NACK-count is greater than the NACK-count threshold (in this example, a threshold of 4). If the NACK-count is determined to be greater than the threshold of 4, then the frame is discarded (column 26, line 60-column 27, line 41, esp. column 27, lines 13-22).

It would have been obvious to one ordinary skill in the art at the time of the invention was made to add a retransmission counter that limits the number of retransmissions to an operator defined integer value and clears the buffer memory after the integer value is reached, such as that suggested by Yonge, in the retransmission system of Sipola in order to avoid unnecessary usage of the communication resources in case of a poor communication between a source and a destination and furthermore, to avoid overflow.

Further, Sipola does not expressly disclose collecting retransmission statistics and adjusting each particular encoding/data modulation using the collected retransmission statistics (as in claim 1); and a CDMA air interface (as in claim 5).

Schramm teaches that the radio base station RBS 22 counts the number of requests for retransmitted blocks and use alternative FEC coding and/or modulation scheme when the counted number of erroneously transmitted blocks exceeds some predetermined threshold (column 7, lines 1-12).

It would have been obvious to one ordinary skill in the art at the time of the invention was made add a collecting retransmission statistics method, such as that suggested by Schramm, in the method of Sipola in order to reduce the probability that the retransmitted block is received erroneously and improve overall system performance (column 4, lines 3-11).

Sipola and Schramm disclose that the ARQ protocol is the RLC layer. An LLC frame to be transmitted by RBS is segmented into RLC blocks then transmitting the blocks to the mobile station through the physical layer (data is received from a higher layer ARQ mechanism).

Sipola in view of Yonge and Schramm does not expressly disclose generating an acknowledgment at the physical layer and the physical layer ARQ mechanism uses packets, which are smaller in size than the higher layer ARQ mechanism.

A physical layer ARQ mechanism is well known in the art. Fong teaches **a dual protocol layer automatic retransmission request scheme** for wireless air interface (see fig. 2 and column 5, lines 26-52). Fig. 4 illustrates that each packet received by a physical layer form a link layer is packaged into **multiple physical layer frames in order to support a lower data rate** (column 6, lines 15-30). Further, Fong teaches that layer 1 ARQ operations provide a quick

recovery for physical layer frames that are lost or received erroneously though retransmission of the physical layer frames.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sipola in view of Schramm's ARQ method to incorporate the teachings from Fong of a dual type arrangement and formatting the received data blocks into smaller size, the motivation being that by including two levels of ARQ operations, layer 1 ARQ operations provide a quick recovery for physical layer frames that are lose or received erroneously through retransmission of the physical layer frames the ARQ system will be more reliable by eliminating any significant additional overhead and provides robust operations across the wireless link (column 2, lines 25-60).

Sipola in view of Yonge and Schramm further in view of Fong does not disclose a physical layer ARQ mechanism is transparent to the higher layer ARQ mechanism.

Cheng teaches that a dual layer ARQ scheme where a physical layer ARQ mechanism is transparent to the higher layer ARQ mechanism (paragraphs 0042-0043).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sipola in view of Yonge and Schramm's further in view of Fong ARQ method to incorporate the teachings from Cheng of a physical layer ARQ mechanism is transparent to the higher layer ARQ mechanism, since Cheng suggests in paragraph 0043 that the physical layer ARQ mechanism being transparent to the higher layer ARQ mechanism would reduce implementation complexity and eliminates delay.

Regarding claim 5, Schramm teaches an ARQ techniques use an alternative modulation/coding scheme using FDMA and CDMA air interface wherein the acknowledgments are transmitted on a fast feedback channel.

It would have been obvious to one ordinary skill in the art at the time of the invention was made to use CDMA, such as that suggested by Schramm, in the radio transmission system of Sipola in order to minimize interference and to increase the capacity data throughput.

Regarding claim 2, Sipola discloses the base station wherein the particular encoding/data modulation is forward error correction FEC (column 2, line 29-37).

Regarding claim 6, Sipola discloses the base station whereby the acknowledgment generator transmits a negative acknowledgment, if any packet has an unacceptable error rate (column 7, line 60-column 8, line 3).

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schramm in view of Yonge, Fong and Cheng as applied to claim 7 above, and further in view of Agee (US 6,128,276).

Schramm view of Yonge, Fong and Cheng discloses all the claim limitations as stated above except for: the packets are transmitted using an OFDMA air interface in which frequency sub channels in an OFDMA set may be selectively nulled.

Agee teaches a radio communication method that is compatible with discrete multiple tone and orthogonal frequency-division multiplex-like frequency channelization techniques (column 4, line 19-column 5, line 40).

It would have been obvious to one ordinary skill in the art at the time of the invention was made to add a method that transmit packets using an OFDMA air interface, such as that suggested by Agee, in the method of Schramm in view of Yonge, Fong and Cheng in order to allow stationary and linear channel distortion to be modeled as an exactly multiplicative effect on the transmit spreading code.

5. Claim 10 is rejected under 35 U. S. C. 103(a) ms being unpatentable over Schramm in view of Yong, Fong and Cheng as applied to claim 7 above, and further in view of in view of Birru (US 2002/0037058).

Schramm in view of Yong, Fong and Cheng discloses all the claim limitations as stated above. Further, Schramm discloses that the invention is applied to all types of access methodologies including FDMA, TDMA, CDMA and hybrids thereof (column 4, lines 49-56).

However, Schramm does not expressly discloses wherein the packet are transmitted using a single carrier having a frequency domain equalization (SC-FDE) air interface.

Birru teaches that a multi-standard demodulator, which includes COMM, a frequency domain equalizer for single carrier results in a cost-effective solution compared to a time domain equalizer.

It would have been obvious to one ordinary skill in the art at the time of the invention was made to use SC-FDE, such as that suggested by Bin-u, in the multi-access methodologies of

Schramm in view of Yong, Fong and Cheng in order to provide cost effectiveness and multi-path performance (0059).

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sipola in view of Schramm, Yong, Fong and Cheng as applied to claim 1 above, and further in view of Agee.

Sipola in view of Schramm, Yong, Fong and Cheng discloses all the claim limitations as stated above except for: the packets are transmitted using an **OFDMA air** interface in which frequency sub channels in an OFDMA set may be selectively nulled.

Agee teaches a radio communication method that is compatible with discrete multiple tone and orthogonal frequency-division multiplex-like frequency channelization techniques (column 4, line 19-column 5, line 40).

It would have been obvious to one ordinary skill in the art at the time of the invention was made to add a method that transmit packets using an OFDMA air interface, such as that suggested by Agee, in the method of Sipola in view of Schramm, Yong, Fong and Cheng in order to allow stationary and linear channel distortion to be modeled as an exactly multiplicative effect on the transmit spreading code.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sipola in view of Yonge, Schramm, Fong and Cheng as applied to claim 1 above, and further in view of Birru (US 2002/0037058).

Sipola in view of Yonge, Schramm, Fong and Cheng discloses all the claim limitations as stated above. Further, Schramm discloses that the invention is applied to all types of access

methodologies including FDMA, TDMA, CDMA and hybrids thereof. However, Sipola in view of Yonge, Schramm, Fong and Cheng does not expressly discloses wherein the packet are transmitted using a single carrier having a frequency domain equalization (SC-FDE) air interface. Birru teaches that a multi-standard demodulator, which includes COMM, a frequency domain equalizer for single carrier results in a cost-effective solution compared to a time domain equalizer.

It would have been obvious to one ordinary skill in the art at the time of the invention was made to use SC-FDE, such as that suggested by Birru, in the multi-access methodologies of Sipola in view of Yonge, Schramm, Fong and Cheng in order to provide cost effectiveness and multi-path performance (0059).

Response to Arguments

8. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saba Tsegaye whose telephone number is (571) 272-3091. The examiner can normally be reached on Monday-Friday (7:30-5:00), First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on (571) 272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ST
March 9, 2006

JOHN PEZZLO
PRIMARY EXAMINER